PROJECT REPORT

E 5006

URINE CONTAINER

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THIS REPORT PRESENT TO:

ELECTRICAL ENGINEERING DEPARTMENT

POLYTECHNIC OF SULTAN SALAHUDDIN ABDUL AZIZ SHAH

TO FULFIL THE REQUIREMENT OF

DIPLOMA IN ELECTRONIC ENGINEERING (MEDICAL)

COURSE

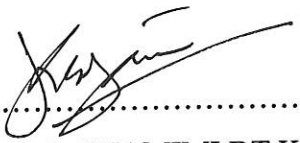
JULY 2007

CONTENTS

TESTINOMIAL

Hereby, we would like to declare that this project was developed and produced based on our own effort and works, expect; some references and appendix that are attached together with this report.

Prepare by,



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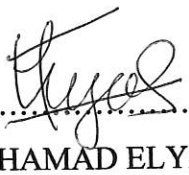

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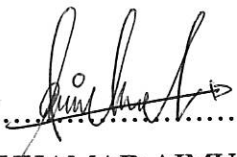

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Certified by,

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(MDM WEE SOO LEE)

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(PUAN FARIZA BT. ZAHARI)

.....

(MISS SUBASHNEE A/P MARIMUTHU)

DEDICATION

WE DEDICATE THIS PROJECT, ESPECIALLY FOR OUR FAMILY TO ALL LECTURER AND ALL FELLOW FRIEND THAT ALWAYS GIVE US SUPPORT AND MOTIVATED

ACKNOWLEDGMENT

ALHAMDULILLAH, With God grace, we finally to manage the complete our project. Here we would like to thank for those whose were involve directly or indirectly for helped and supported to finish our project successfully.

For our beloved parent, thank for everything because give us we supported and actuation in out project. Support and motivation give us full of high spirit to complete our project.

And for lecturer, thank for given cooperate and for helped at everything. Especially, we would like to thank very much for our assessed project lectures Mrs. Fariza bt.Zahari. For given instruction for us to finished our project. The guidance and instruction help us to produce our project very systematic and strategic.

Also, not forget to all friends in our class and team robocon. We are proud because our fellow friend is responsible and work together. We appreciate for helping, cooperate and supporting us to finish our project.

Lastly, we would like to thank very much for all because given us helping whether in direct or indirectly. For everything thank you for all and you will always in my mind.

MAY ALLAH BLESS US…..

ABSTRACT

Usually the urine container for can get from urine at the bladder. Our project detect urine bag with LED and sound buzzer if urine bag full. We attempt for combination the urine detector with a nurse call. To make easy for he staff nurse to check out immediately to patient.

The staff nurse did not have to waste their time observe all the patient, they just only wait to observe patient a the counter when buzzer sounded.

Minimum urine output is define the minimum amount of urine production needed to ensure adequate renal failed. Normal urine output is age dependent (30ml).

A spigot at the base of the bags provide a means for empty the bag. To keep the drainage system patient the nursing check for the client on the drainage tubing, avoid positioning the client on the drainage tube or sediment that may occlude the collecting urine.

We used programming PIC16F877A for the our project because PIC16F877A very simple and easy program and not more circuit connected.

OBJECTIVES

This project is of the subjects that combines theory and practical together. The reasons for making the ' Urine Container ' is ;

1. The students can know the electronic component and understands the circuit operation.
2. To give general knowledge to the students on how and the steps driving projects.
3. Student can learn the proper usage of the machine and hand tools and using them to complete the projects.
4. Students show their hand work in completing their projects.
5. To reveal to the students about the responsibility and work the student will face when going out to work soon.
6. To train the students to be confident and has a self-confident and contribute good ideas in delivering dedicated, dynamic, creative, innovative and experience that can help them during maintenance of electronics equipment.
7. The students receive the basic expertise like soldering, etching, circuit drawing, circuit connecting and so on.
8. To bring out the talents for the students in field pf electronics.
9. To make the students interested in electronics.
10. To plant co-operation spirit and nature of helping each other amongst students in getting a quality and perfect efficacious work.

CHAPTER 1 : INTRODUCTION

1.1 PROJECT INTRODUCTION

This project are depressed to a medical electronic which a new scope in this country. For the information, this project is a combination between the nurse call with the LED detector and the buzzer sound for give a signal to hospital staff or nurse know if there have enough 1 hour/ 30ml.

Now, every hospital have Intensive Care Unit (ICU), so the urine container located at there. It's only at ICU not another ward or another unit. It happened because urine container only used the chronic patient which is the patient cannot to stand up or move from their bed. This situation can be easy when every hospital have a urine container which the alarm of detector or sensor for nurse to do the job punctually.

1.2 INTRODUCTION OF URINE PRODUCT

Catheterization

Catheterization of the bladder involves introducing a rubber or plastic tube through the urethra and into the bladder. The catheter provides a continuous flow of urine in clients unable to control mixturation or those with obstructions. It is also provide a means of assessing urine output in hemodynamically unstable pt.

Types:

1. Intermitten Catheterization
2. Indwelling Catheterization

Intermittent Catheterization

A straight single use catheter is in introduced long enough to drain the bladder (5-10min). When bladder is empty, the nurse immediately withdraws the catheter and repeated as necessary.

Indwelling Catheterization

It is remains in place for a longer period until a client is able to void completely and voluntarily or as long as accurate measurements are needed. It has a small inflatable balloon that encircles the catheter just above the tip. Urine drains from the tip, through the lumen , and to a receptacle. When inflated, the balloon rests against the bladder outlet to anchor the catheter in palace. It may have two or these lumens within the body of the catheter. One lumen drains urine through a catheter to a collecting tube. Second lumen carries sterile water to form the balloon.

Closed Drainage Systems

After inserting an indwelling catheter, the nurse maintains a closed urinary drainage system to minimize the risk of infection. Urinary drainage bags are plastic and can hold about 1000ml to 1500ml of urine. The bag should hang on the bed frame without touching the floor. The bag should be lower from bladder or should not above the bladder level. Urine in the bag and tubing can become a medium for bacteria, and infection is likely develop if urine flows back into the bladder. Most drainage bags contain an antireflux valve to prevent urine in the bag from reentering the drainage tubing and containing the client's bladder. A spigot at the base of the bag provide a means for emptying the bag. The spigot should always be clamped, except during emptying, and tucked into the protective pouch on the side of the bag. To keep the drainage system patient the nurse checks for kinks or bends in the tubing, avoids positioning the client on the drainage tubing, and observes for clots or sediment that may occlude the collecting tube.

Indication for Catheterization

Intermittent Catheterization

It relief of discomfort of bladder distention, provision of decompression. It obtain sterile urine specimen. Assessment of residual urine after urination. Long term management of clients with spiral cord injuries: neuromuscular deganaration, or incompetent bladders.

Short-term Indwelling Catheterization

Obstruction to urine outflow, surgical repair of bladder, urethra , and surrounding structures. Prevention of urethral obstruction from blood clots. Measurement of urinary output in critically ill clients and continuous or intermittent bladder irrigations.

Long-term Indwelling Catheterization

Serve urinary retention in recurrent episodes. Ulcers or wounds irritated by contact with urine and terminal illness when bed linen changes are painful for clients.

1.3 INFORMATION OF OUTPUT REGULATION

Fluid output regulation

It's occurs through four organs of water loss: the kidneys, the skin, the lungs and the gastrointestinal tract. The kidneys are the major regulatory organs of fluid balance. They receive approximately 180L of plasma to filter each day and produce 1200-1500mlof urine.

Adult average fluid gains and losses

Fluid gains	ml	Fluid losses	ml
Oral fluids	1100-1400	Kidneys	1200-1500
Solid foods	800-1000	Skin	500-600
Metabolism	300	Lungs	400
Total	2200-2700	GI	100-200
		Total	2200-2700

Monitor Urine Output

Minimum urine output is defined as the minimum amount of urine production needed to ensure renal failure.

Urine output:

A urinary catheter should be inserted to accurately measure urinary output. Normal urine output is age dependent.

Normal is 2ml/kg/hr

Toddler = 1.5ml/kg/hr

Older child = 1ml/kg/hr

Adult = 0.5ml/kg/hr

To maintain adiquote renal functions- minimal urine output is 30ml/hr.

Close monitor of urine output is necessary to make sure that the dehydration status of patient is normal, renal function is in a well condition, no sign of hypovoleruc and in monitoring adaquate fluid and electrolyte replacement. Usually, patient who has undergone surgery should be monitored closely on the effect of anaesthetic. Anaesthesia may effect function of the organ including renal. Other patient that must be monitored closely are:

- Cardiac problem
- Renal problem function
- Patient after operation
- Patient on IV therapy

1.4 ACTION TAKEN FROM NURSE

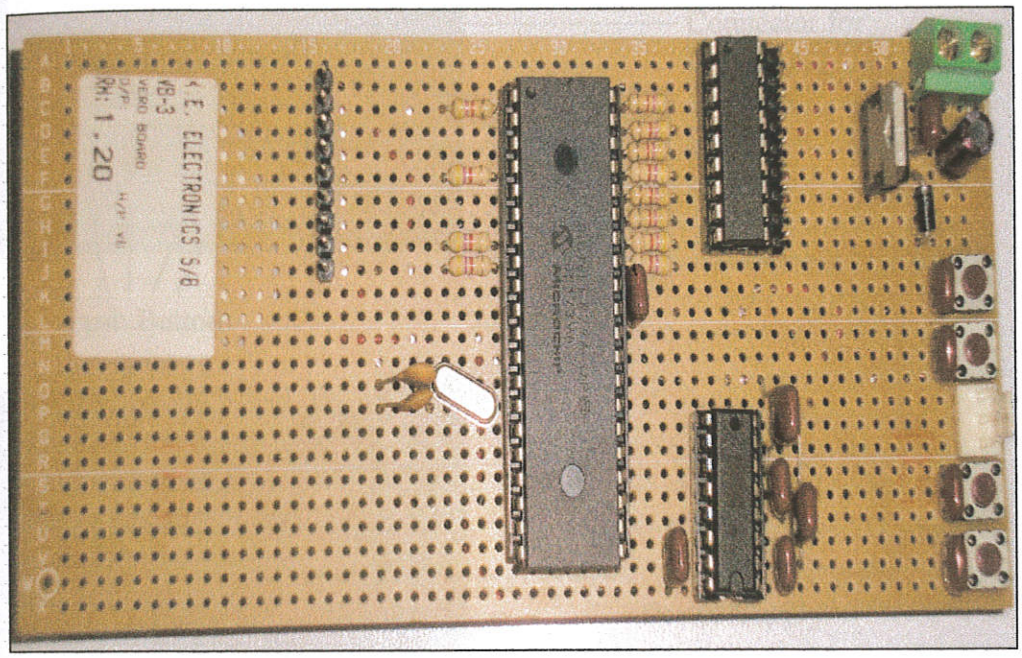
Firstly, nurse must be record each intake and patient output. Intake means solution entered to patient body and output is solution push put from patient. The out of solution from body patient must be observed and recorded. That is urine. Charateristic of urine like a color, value of measurement and needed to record.

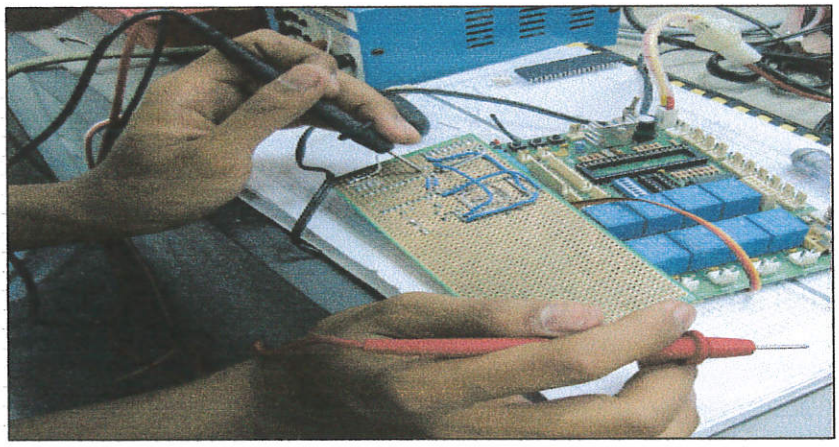
Urine observation depends on the doctor and patient condition. For the chronic patient and patient after operation ' urine container' is every hour and total of urine 30ml/hr must be stable for make sure the patient in the good condition.

After patient stable 'urine container' need to do every 4 hours and recorded. Also have the patient needed observation every 2 hour and 6 hour.

CHAPTER 2 : LITERATURE CIRCUIT

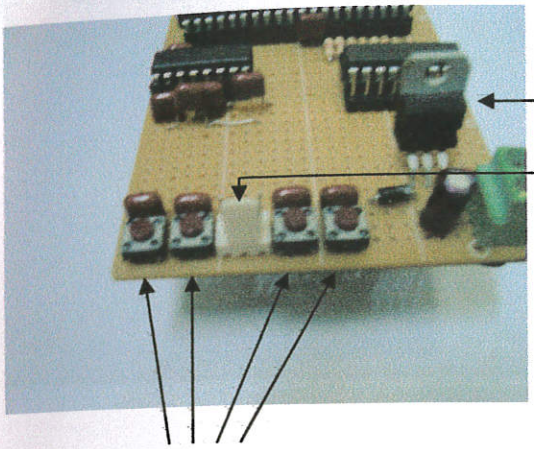
2.1 PROJECT CIRCUIT

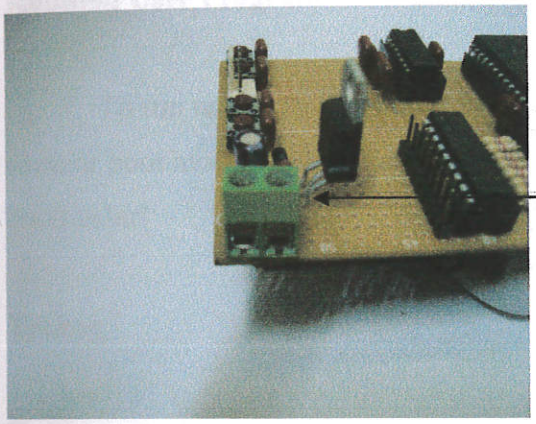


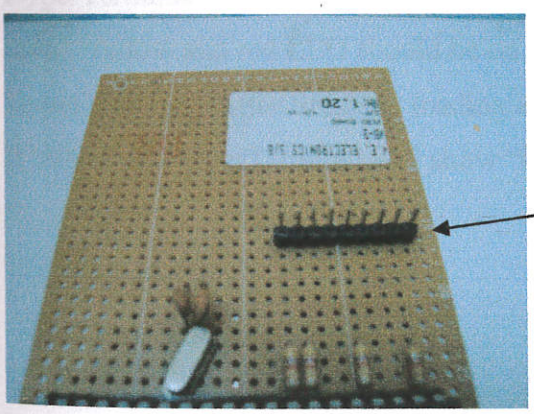


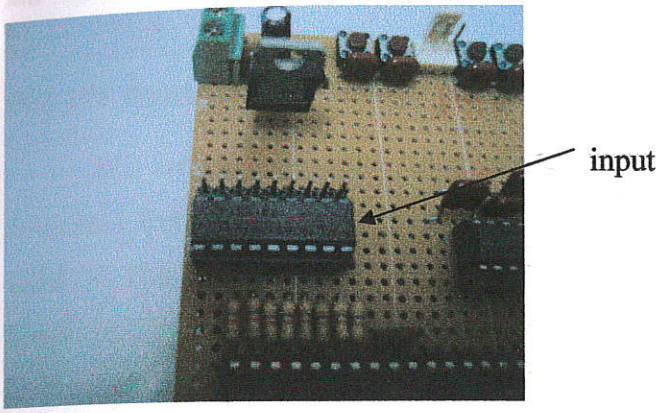
CIRCUIT PIC

LAYOUT BOARD









Running User Program

To run user program after bootloading, just simply reset the microcontroller, and to enter boot mode again, repeat the steps described. And now, you are ready to test your bootloader!

Testing

Now try to enter Boot mode using PIC16F877A and load some program with HyperTerminal to your microcontroller board to test the program. If the board enter Boot mode, yellow and red LED should be on. And you will receive "UMS!" on the HyperTerminal. After finishing loading a program, the HyperTerminal will show "OK!". If failed, the HyperTerminal will show "Failed".

2.2 PROGRAMMING PIC

PIC 16F Bootloader Firmware

It's embedded in the microcontroller and the Bootloader firmware could be download from Microchip website with AN732 document. however, that version is for 16F87X. There are some configurations and setting required attention before burning this firmware. There are:

a). Crystal Speed

b). Boot Switch

c). LED (optional)

a) Crystal Speed

The baud rate of serial communication must be the same as HyperTerminal of PC (It may be changed, but both side must be same). The baud rate of microcontroller depends on the crystal speed. There are a few options in the ASM file for different speed of crystal. However, the value could be calculated based on the formula explained in the page 113 of PIC16F87XA data sheet.

b) Boot Switch

The default Boot switch is at RB0 (pin 33), however, this pin can be change to any I/O pin on PIC microcontroller (except 4 pin which involve for UART). If this bit is required to be changed, new pin should be set as digital input and it should be check after at the start of program.

c) LED (optional)

LED can be added to indicate which mode the microcontroller enter anyway,it's optional to add. However, firmware modification is necessary. The corresponding pins should be

configuring as output. Then we must decide to ON the LED during the Boot mode or to OFF the LED.

Running User Program

To run user program after bootloading, just simply reset the microcontroller, and to enter boot mode again, repeat the steps described. And now, you are ready to test your bootloader.

Testing

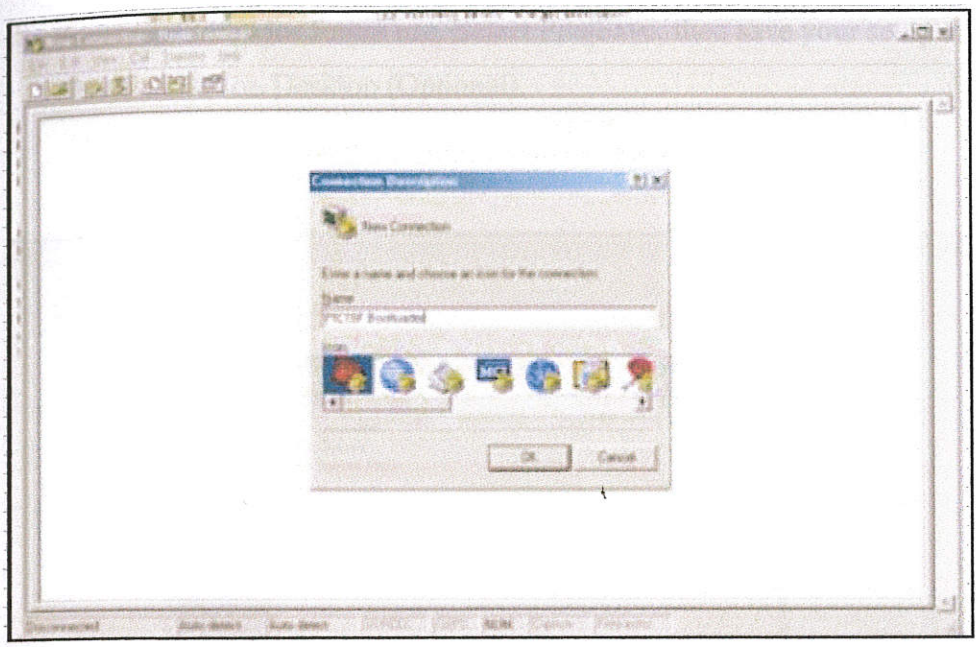
Now try to enter Boot mode using PIC16F877A and load some program with HyperTerminal to your microcontroller board to test the program. If the board enter Boot mode, yellow and red LED should be on. And you will receive "UMS!" on the HyperTerminal. After finishing loading a program, the HyperTerminal will show "OK!". If failed, the HyperTerminal will show "Failed".

FIRST STEP PROGRAMMINIG PIC16F877A.

First step you know before applied PIC16F877A :-

1. Connect the power supply to circuit PIC power port. The suitable voltage value for this circuit is 11V but voltage regulator always make sure only 5V and 1A will operate PIC16F877A. We can have the power supply from battery or adapter. **MAKE SURE THAT THE CONNECTION (POLARITY) IS CORRECT !**

2. Run HyperTerminal by going to start button \Programs \Accessories \Communications\HyperTerminal. You may name this setup as "Bootloader"



3. Change the BPS (Baud rate) to 9600, Data bits=8, Parity=none, Stop bits=1 and Flow Control= Hardware, then everything is OK!

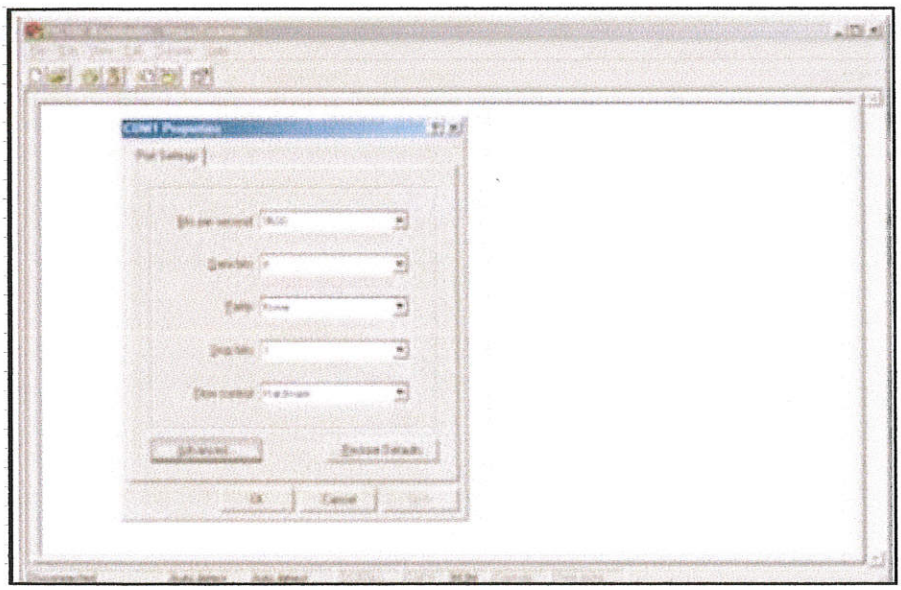


Figure : How to change the BPS (Baud rate) to 9600, Data bits=8, Parity=none, Stop bits=1 and Flow Control= Hardware

4. Save your setup for future use. Select File|Save, then save your setup as "Bootloader" on Desktop (Optional).

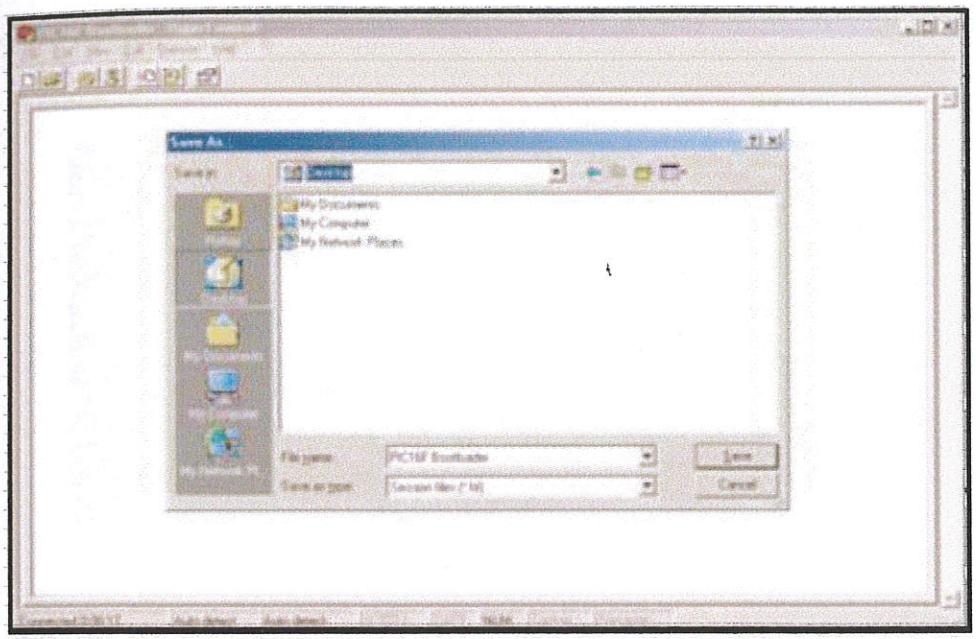


Figure : Save your setup for future us